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SUSQUEHANNA RIVER BASIN COMMISSION
5012 LENKER STREET
MECHANICSBURG, PENNSYLVANIA 17055

REPORT
ON
SATELLITE DATA RELAY EXPERIMENT
CONDUCTED BY
THE U.S. GEOLOGICAL SURVEY
SUSQUEHANNA RIVER BASIN

SEPTEMBER 11, 1974

SUSQUEHANNA RIVER BASIN COMMISSION

ROBERT J. BIELO
EXECUTIVE DIRECTOR

PREPARED BY:

JERRALD R. HOLLOWELL
GROUND WATER GEOLOGIST


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SUSQUEHANNA RIVER BASIN COMMISSION

5012 LENKER STREET

MECHANICSBURG, PENNSYLVANIA 17055

TELEPHONE: 717 - 737-0501



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On February 1, 1973, the Susquehanna River Basin Commission entered into a cooperative agreement with the U.S. Geological Survey providing financial support for the installation and testing of four data collection platforms at selected USGS gaging stations in the Susquehanna River Basin.

The primary objective of the experiment was to test thoroughly the utility of the ERTS-DCS for relaying hydrologic data from existing stream gages, precipitation gages, observation wells, and water quality monitors operated by the U.S. Geological Survey. Such a program was being conducted in cooperation with agencies in the Delaware River Basin and, because of the record flood caused by Hurricane Agnes in June 1972, it was proposed that the investigation be expanded to cover the Susquehanna River Basin, and include close operational cooperation with the Harrisburg River Forecast Center. Flood forecasting by the Harrisburg River Forecast Center was seriously hampered by the disruption of conventional communication systems that were used for transmitting river flow and stage data during the flood crisis.

The expected result of the investigation would be a thorough field test of the Data Collection Platforms and a test of the ERTS-DCS for monitoring of hydrologic

conditions for water resources management and flood forecasting in two major eastern river basins.

A committee of hydrologists from the USGS, the River Forecast Center, the Pennsylvania Department of Environmental Resources (DER) and the SRBC chose the locations for these four Data Collection Platforms. The platforms are installed on gaging stations located on the Susquehanna River at Towanda and Harrisburg, Pa., the West Branch Susquehanna River at Lewisburg, Pa., and the Juniata River at Newport, Pa.

The ERTS-1 satellite collects data from the Data Collection Platforms during orbits between 8 a.m. and 12 noon and 8 p.m. and 1 a.m. This information is then recorded at the two ground sites in either Maryland or California, depending upon the location of the satellite, and transmitted to the NASA computer. The data are sent by teletype to the USGS office in Harrisburg, Pa. for processing and evaluation. The total time elapsed from transmission of data from a Data Collection Platform to receipt at local USGS office is less than one hour. Processed data has been transmitted, via the teletype, to the DRBC, City of Philadelphia Water Department, New Jersey district office of the USGS, and the Delaware River Master on a daily basis and provided to the River Forecast Center on request. The Commission receives the data by mail from the USGS office, however, in an operational

system the data could be made available quickly by teletype. The installation of speed computer facilities in the Harrisburg district office could make the system operational with a turnaround time of less than two hours.

The Data Collection Platforms located on gaging stations at Harrisburg and Newport have been equipped with add-on memory units. These platforms now store and transmit the twelve most recent hourly river stages. These data, periodically relayed by ERTS, are processed by USGS in Harrisburg, Pa. A simulation of conventional USGS basic data collection provided daily maximum, minimum and mean streamflow. Turnaround time of six weeks for normal processing of streamflow data was reduced to one day. This allows, during extraordinary conditions, for data to be supplied for flood forecasting, especially when conventional data collection methods fail as they did during Hurricane Agnes.

The objectives of the experiment, (1) to interface standard operational USGS water resource instrumentation and computer facilities with the Data Collection System, and (2) measure the operational behavior of the Data Collection Platforms and the interface devices, was successful. The addition of the memory devices has magnified the success of the experiment.

